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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/399,540	09/20/1999	NENAD IVEZIC	6321-147	2387

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EXAMINER

FERRIS III, FRED O

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 12/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/399,540	IVEZIC ET AL.
Examiner	Art Unit	
Fred Ferris	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 21 October 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-17 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 20 September 1999 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

1. *Claims 1-17 have been presented for reconsideration. Claims 1-17 remain rejected by the examiner.*

Response to Arguments

2. *Applicant's arguments filed 21 October 2002 have been fully considered but they are not persuasive.*

Regarding objections to the drawings: *Applicant's have not submitted corrected drawings. Examiner upholds objection to the drawings.*

Regarding response to 102(b) rejections: **Per independent claims 1, 8, 13:**
*Applicants have argued that Lin does not teach the use of agents in performing manufacturing simulation or manufacturing modeling techniques. Examiner asserts that Lin is specifically directed toward **manufacturing simulation and techniques** using **agents to model the manufacturing process**. (Section 4: para 1 - line 2, para 2 – line 5, Section 5: para 1 – line 11, para 3 – line 6, 18, 21, para 4 – functions of agents: manufacturing agent, Table 1, Fig. 3, 4) Further, any computer implemented "model" is in fact a simulation of the modeled process.*

*Applicants have also argued that Lin does not teach programming an agent to respond to manufacturing events or trigger responses. Examiner asserts that Lin specifically teaches that agents communicate in response to manufacturing events (Section 5: Manufacturing Agent, Section 6: para 2, Table 2) and respond to triggered actions. Further, it is well known in the art that "agents" are simply **programmable software entities** used to independently perform background information processing*

and monitoring, with the ability to alert (communicate, message) with other (adjacent) agents (upstream or downstream), and make decisions (respond) based on monitored information and processed results. Accordingly, programming an agent, triggering a response, and responding to events, would be inherent features to any agent based model including Lin. (Also see Lin Section 6: para 10, 14, Section 5: para 2 – line 20, Table 2: trigger agent actions)

Applicant's have also argued that Lin does not teach manufacturing techniques relating to Takt time. As disclosed in applicant's specification, takt time merely involves an agent comparing and responding to a clock tick message to retrieve resources and pass a completed process output to another (upstream) agent. In addition to being taught by Lin, this process would also be an inherent feature of any "intelligent" agent based model. (See Lin Table 1, Section 5, Section 6 (1) and (2))

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., loose coupling, Push, and Pull techniques) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's have admitted that independent claims are "broadly claimed" (paper 9, page 4, line 12). Further, examiner submits that applicants have not amended claims to clearly distinguish the claimed invention from prior art of record. Accordingly, this action is made final.

Drawings

3. *The drawings are objected to because of margins (37 CFR 1.84(g)) and size of reference characters in Figures 1-7, (37 CFR 1.84(p)). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.*

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. *Claims 1-17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by "Modeling Supply-Chain Networks by a Multi-Agent System" F. Lin et al, Proceedings Systems Sciences, ISBN: 0-8186-8255-8, P105-114, Jan. 1998.*

Independent claim 1 is drawn to:

**agent based manufacturing simulation steps of:
modeling manufacturing processes via agent
programming agent to respond manufacturing events and trigger response**

Regarding claim 1: Lin teaches a multiple agent based manufacturing simulation model where manufacturing processes are mod led via agents that are

programmed to respond to manufacturing events and trigger a response.

(Abstract, Introduction, Figs. 1-5, Tables 1,1, Sec. 2, para1-line1-15, Sec. 4, para1-line1-7 & sub-sec. 1-4, Sec. 5, para1-line1-18, para3(all), para5(all), Sec. 6, sub-sec. 1-5, para2(all))

Dependent claims 2-7 are drawn to:

transmitting events to agent

conditioning **(programming) agent** to respond to **events** of; clock tick message,

resources message, output production message

programming where:

agent places **finished output** process **in stack** (clock tick message)

agent initiates **output production using process stack** (resources message)

initiate production if adequate resources

agents **pass** to associated agent **upstream process** in stack in response to **event**

agents **inspect process stack** for adequate output (production message)

inspect input stack if stack lacks adequate output

request output production message (agent downstream) **if lacks resources**

agents **pass** to associated agent **upstream process** output in response to **event**

setting minimum output stack level corresponding to **process**

agent **produce replacement output** in response to output **below minimum** level

agent **compares** clock **message** with time corresponding to process and correlates

agents **place completed output in stack** corresponding to **process**

retrieve resources in stack corresponding to **associated process**

initiate production of output **using resources** contained in stack

pass agent associated with upstream process **output in stack**

*Regarding claims 2-7: Lin teaches the **transmitting** (communication) of **events** (tasks) between agents (via message passing, Sec.4, sub-sec. 1-4) where agents are **conditioned** (programmed) to perform various **tasks (events)** in response to **time stepped** scheduling (clock tick) (Sec. 5, para2-line18-22, Table 2, Sec.4, sub-sec. 1-4) of events relating to **resources** (inventory management) and **production** (production, capacity, and material planning). (Sec. 5, para5 (functions of agents)). Lin further*

*teaches a model where agents initiate **output production** based on the availability of **adequate resources** under the control of **distributed** agents relating to order management, inventory (resources), production (**output production**), capacity, material planning (resources), shop, manufacturing, and management. (Sec. 5, para5 (functions of agents))*

*Lin also teaches a model where agents relate the different **processes** and activities relating to production, resources, movement of materials, etc. via **upstream** and **downstream** linkages (claims 4, 5, 7). (Sec. 3, para1, line9, sub-sec. 2 (roles of entities), sec. 5 (order management agent), sec. 6 ((2) Information Sharing Strategies))*

*Claimed features relating to **stack operations** (claims 3-7) such as **stack inspection** (testing for a particular quantity or value), placing values (**retrieving resources**) on/off the stake (pushing/popping), setting **stake levels (minimum output)**, **multiple stacks (process and others)**, etc. are simply obvious use of well known computer programming techniques and inherent to any programmed simulation (including Lin).*

Independent claim 8 is drawn to:
simulation of manufacturing process via agents with steps of:
receiving message from agent and identifying as, clock event, resources event, production event; **performing activity** in response to **event**; and **messaging adjacent agent** in response (handshake)

*Regarding independent claim 8: As previously cited Lin teaches a **multiple agent based manufacturing simulation model** where **manufacturing processes** are*

*modeled via agents and further teaches agents responding to, and performing an activity in response to, **time stepped** scheduling (clock tick) (Sec. 5, para2-line18-22, Table 2, Sec.4, sub-sec. 1-4) of events relating to **resources** (inventory management) and **production** (production, capacity, and material planning). (Sec. 5, para5 (functions of agents)). Lin further teaches the **transmitting** (communication) of **events** (tasks) between agents (via **message passing**, Sec.4, sub-sec. 1-4) where agents are **conditioned** (programmed) to perform various **tasks (events)**. It is further obvious (and inherent in cited prior art) that the **messaging agents** would respond (handshake) in response to an **adjacent** message communication. (Lin teaches message passing between agents, Sec. 4, sub-sec. 4, line 7)*

Dependent claims 9-12 are drawn to:

placing finished output in stack corresponding process (clock event)
initiating production output corresponding to process (resources event)
passing agent upstream process output produced

inspecting input stack corresponding to process
initiating production if stack has adequate
inspecting stack corresponding to process **for adequate output**
inspecting stack corresponding to process **if lacks output**
initiating production if stack has adequate **resources to satisfy request**
posting request for production message to agent downstream **if lacking resources**
passing agent upstream process output produced
identifying minimum output corresponding to process
producing replacement if output **below minimum** level

comparing and correlating clock event with time corresponding to process
placing completed output in stack corresponding associated process
retrieving resources in stack corresponding to process
initiating production of output using resources in stack
passing to agent upstream output in output stack

*Regarding dependent claims 9-12: As also previously cited, Lin discloses a model where **agents** initiate **output production** based on the availability of **adequate resources** under the control of **distributed agents** relating to order management, inventory (resources), production (**output production**), capacity, material planning (resources), shop, manufacturing, and management. (Sec. 5, para5 (functions of agents)) It is obvious in a manufacturing simulation model to initiate a production output based on the availability of adequate resources. (see Lin Sec. 5, para5 (functions of agents))*

*Lin further teaches a model where agents relate the different **processes** and activities relating to production, resources, movement of materials, etc. via **upstream** and **downstream** linkages (claims 4, 5, 7). (Sec. 3, para1, line9, sub-sec. 2 (roles of entities), sec. 5 (order management agent), sec. 6 ((2) Information Sharing Strategies))*

*Also as further cited, the claimed features relating to **stack operations** (claims 9-12) such as stack **inspection** (testing for a particular quantity or value), placing values (**retrieving resources**) on/off the stake (pushing/popping), setting **stake levels** (**minimum output**), multiple stacks (**process** and others), etc. are simply obvious use of well known computer programming techniques and inherent to any programmed simulation (including Lin).*

Regarding claims 13-17: Claims 13-17 merely relate to a computer apparatus programmed with a routine set of instructions stored in a fixed medium and means for

the features outlined in previous claims. These claims are therefore rejected using the same reasoning as disclosed above.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, careful consideration should be given prior to applicant's response to this Office Action.

U.S. Patent 6,108,662 issued to Hoskins et al teaches simulation of manufacturing process behavior.

U.S. Patent 6,014,637 issued to Fell et al teaches agent based modeling and simulation.

U.S. Patent 6,088,689 issued to Kohn et al teaches multiple agent based process architecture.

"Multi-Agent Simulation for Balancing of Assembly Lines", I. Praca, Proceeding IEEE, 0-7803-5704-3/99, teaches agent based manufacturing simulation.

"Use of Discrete Event Simulation to Validate an Agent Based Scheduling Engine", S. Biswas, Proceedings Winter Simulation Conference 2000, P1778-1782, teaches agent based event simulation.

"Simulation-Based Production Control in the Semiconductor Industry" M. Thiel, Proceedings Winter Simulation Conference 1998, P1029-1033, teaches agent based manufacturing simulation.

"Agent-based Control of Manufacturing Systems" L. Monostori, Proceedings IEEE 1999, 0-7803-5489-3/99, teaches agent based manufacturing simulation.

"Enterprise Modeling and Simulation Platform Integrating Manufacturing System and Supply Chain" F. Kubota, Proceedings IEEE 1999, PIV-511-515, 0-7803-5731-0/99, teaches agent based manufacturing modeling.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.

The Official Fax Numbers are:

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